Remarks

The arguments from the previous responses are incorporated herein by reference. Applicant submits that the above amendments and newly added claims further distinguish the claimed invention from the cited prior art, more particularly claim the invention, and place the claims in better condition for appeal. The above amendments do not raise the issue of new matter. Support for the above amendments can be found in the Specification on page 8, lines 12-22, and in Figure 5. It is noted that Claim 25 has been rewritten in independent form, and that this amendment does not relate to the prior art.

Claims 24-25 and 28-32 stand rejected under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. §103(a) as being obvious over Charlier et al. "Structural and electric properties of pentagon-heptagon pair defects in carbon nanotubes" ("Charlier"). The Action states that the Examiner agrees that the Charlier reference does not teach a means of making the claimed structures. The Action further states that

> it is maintained that the Charlier reference provides a study of heptagon-pentagon defects, leading one to a reasonable expectation that the claimed structure is naturally occurring. Charlier does not explicitly enable one to produce the structure, rather Charlier teaches that the structure naturally occurs.

As discussed in the Communication Accompanying Request for Continued Examination filed June 9, 2003, the U.S. Court of Customs and Patent Appeals held in In re Seaborg, 328 F.2d 996 (C.C.P.A. 1964), that the element Americium was patentable over a prior device that only produced trace amounts of the element. The Patent Office took the position in In re Seaborg that the claims were not patentable because the product was inherently produced in the operation of the prior art reactor. Id. at 997. In reversing the decision of the Board that the reference inherently disclosed Americium, the Court in In re Seaborg stated that "the claimed product, if it was produced in the Fermi [prior art] process, was produced in such minuscule amounts and under such conditions that its presence was undetectable." Id. at 999-1000.

Charlier discusses that pentagon-heptagon defects that are naturally occurring are randomly aligned. Charlier, page 53, col. 1. Like In re Seaborg, the cited prior art does not show that the claimed invention occurs in prior art nanotubes. In fact, Charlier does not

discuss the specific claimed configuration. To the extent that the Action speculates that such configurations might occur, it would only be in minuscule amounts that Charlier itself discusses would be undetectable.

The claimed configuration is directed to a dipole of pentagon-heptagon and heptagon-pentagon dislocation cores located in an opposed, spaced-apart relationship that separate regions of differing lattice structure (Claim 24). As discussed in the Action and in contrast to the claimed configuration, Charlier proposes that the defects create small local deformations in the width of the nanotube. Charlier discusses that these small local deformations are randomly aligned and provides calculations related to hypothetical configurations. Charlier, page 53, col. 1. Charlier contains no discussion of a dipole of pentagon-heptagon and heptagon-pentagon dislocation cores located in an opposed, spaced-apart relationship that separate regions of differing lattice structure as recited in the claims. Charlier further discusses that all defects are difficult to detect experimentally because the defects are generally randomly or accidentally aligned. Id.

In summary, Charlier merely discusses theoretical calculations of hypothetical nanotube formations. None of the hypothetical formations include the claimed configuration. As conceded in the Action, Charlier contains no mention of how to make such formations. Charlier discusses that the presence of these deformations is hard to detect experimentally because the defects are randomly aligned. Charlier, page 53, col. 1. In light of these discussions found in Charlier and the total lack of discussion regarding the specific claimed configuration, there is no "reasonable expectation" that the claimed configuration (i.e., a dipole of pentagon-heptagon and heptagon-pentagon dislocation cores located in an opposed, spaced-apart relationship that separate regions of differing lattice structure) is naturally occurring as asserted in the Action.

Claim 25 and new Claims 33-38 contain recitations similar to Claim 24 and are patentable for at least the reasons discussed above and in the previous responses. In addition, Claims 25 and 33-38 are separately patentable for the reasons that follow.

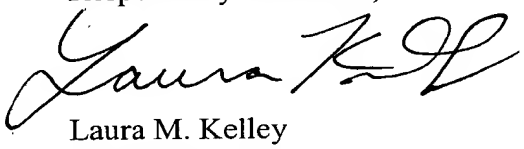
Charlier discusses that the pentagon-heptagon defects are randomly aligned and difficult to detect experimentally. As conceded in the Action, Charlier does not enable one to produce the claimed structure. Therefore, the randomly aligned, small, local deformations

discussed in Charlier do not teach or suggest or provide an enabling disclosure of an article of manufacture having a nanotube of the claimed configuration. The articles of manufacture include an infrared sensor for thermal imaging (Claim 33), a nanoscale diode(Claim 34), a photoelectric cell (Claim 35), a nanoscale transistor for submicroelectric devices (Claim 36), an integrated circuit device (Claim 37), or a second nanotube of the recited configuration in which the first and second nanotubes form a layered concentric nanotube structure (Claim 38).

Conclusion

Applicant respectfully submits that, for the reasons discussed above, the present case is in form for allowance. Accordingly, Applicant requests allowance of all the pending claims and passage of this application to issue.

Respectfully submitted,

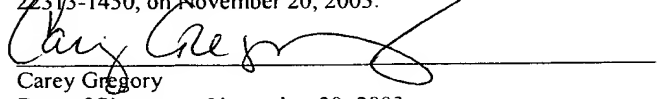


Laura M. Kelley
Registration No. 48,441
Attorney for Applicants

Myers Bigel Sibley & Sajovec, P.A.
P.O. Box 37428
Raleigh, North Carolina 27627
Telephone: 919/854-1400
Facsimile: 919/854-1401

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450, on November 20, 2003.



Carey Gregory
Date of Signature: November 20, 2003